

REMARKS

This responds to the Office Action mailed on October 6, 2004.

Claims 22, 27, 37, and 48 are amended. No claims are canceled or added. As a result, claims 22-29, 35-40, and 46-52 are now pending in this application.

Applicants Request the Examiner to Consider Information Disclosure Statement Previously Submitted on December 29, 2003

Applicants filed an Information Disclosure Statement on December 29, 2003. To date, Applicants have not received the Form 1449 filed therewith and marked as being considered by the Examiner. Pursuant to the provisions of MPEP 609, Applicants request that a copy of the Form 1449, initialed as being considered by the Examiner, be returned to the Applicants with the next official communication.

Amendments to the Specification

Applicants have amended the paragraph beginning on page 8, line 24 by deleting the sentence “In an embodiment, the particles 116 are distributed substantially uniformly throughout the underfill 116”. In addition, “particles 120” has been substituted for “particles 116” to conform the written description to the figures.

No new matter has been added by way of these amendments to the specification.

Amendments to Claims 22, 27, 37, and 48

Each of independent claims 22, 27, 37, and 48 has been amended by deleting the limitation “wherein the particles are distributed substantially uniformly throughout the underfill” [or “underfill material”].

Further, in independent claims 22, 27, and 48, the language “most but not” has been substituted for “substantially”; and the language “, with one or more particles being embedded in one of the terminals, in its corresponding pad, or in both the one terminal and its corresponding pad without preventing adequate physical and electrical contact” has been added.

In independent claim 37, the language “one or more particles are embedded in one of the terminals, in its corresponding pad, or in both the one terminal and its corresponding pad, but such one or more particles” has been substituted for “any particles remaining in the connections”.

Support may be found for this language in the paragraph beginning at line 4 of page 11. No new matter has been introduced.

Objection to Amendment Filed on July 12, 2004

The Examiner objected to the amendment filed with the U.S. Patent Office on July 12, 2004 (received July 15, 2004) under 35 U.S.C. §132, asserting that it introduces new matter. Without admitting or denying this allegation, Applicants have removed the language objected to by the Examiner.

For the above reasons, Applicants respectfully request that the objection be withdrawn.

**Rejection of Claims 22-29, 35-40, and 46-52
under 35 U.S.C. §112, First Paragraph**

Claims 22-29, 35-40; and 46-52 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The Examiner asserted that the claims contained subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed subject matter. Without admitting or denying this allegation, Applicants have removed from the relevant claims the language objected to by the Examiner.

For the above reasons, Applicants respectfully request that the rejection of claims 22-29, 35-40, and 46-52 under 35 U.S.C. §112, first paragraph, be withdrawn.

Rejection of Claims 22-29, 35-40 and 46-51
Under 35 U.S.C. §102(e) as Anticipated by Hoang

Claims 22-29, 35-40, and 46-51 were rejected under 35 U.S.C. §102(e) as being anticipated by Hoang (U.S. 6,373,142). Applicants do not admit that Hoang is prior art and reserve the right to swear behind Hoang as provided for under 37 C.F.R. §1.131.

Hoang discloses a semiconductor chip package and a method of assembly wherein the underfill material between the chip and the package substrate doesn't contain any filler material when the chip is placed upon the underfill. In fact, Hoang teaches away from placing a chip upon underfill containing filler material (see col. 9, lines 22-25), stating that it can interfere with the electrical bonding of the solder balls to the package substrate.

In contrast to the process used to produce the structure shown in FIG. 1B of Hoang, it is an attribute of Applicants' process that some relatively small potentially inhibiting particles may remain between corresponding terminals and pads, but relatively large potentially inhibiting particles are squeezed out, enabling a satisfactory bond to be made between the terminals and pads.

As now amended, each of Applicants' independent claims 22, 27, 37, and 48, as currently amended, recite that one or more particles are embedded in one of the terminals, in its corresponding pad, or in both the one terminal and its corresponding pad, without preventing adequate physical and electrical contact. This structure cannot occur in the semiconductor chip package of Hoang, because in Hoang the filler particles are introduced after the chip is mounted on the substrate.

The rule under 35 U.S.C. §102 is well settled that "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). MPEP §2131.

For the above reasons, independent claims 22, 27, 37, and 48 should be found to be allowable over Hoang, and Applicants respectfully request that the rejection of independent claims 22, 27, 37, and 48 under 35 U.S.C. §102(e) as anticipated by Hoang be withdrawn.

The claims that depend from independent claims 22, 27, 37, and 48 are also asserted to be allowable for the reasons presented above.

Rejection of Claim 52 under 35 U.S.C. §103(a)
as Unpatentable over Hoang in Combination with Gilleo

Claim 52 was rejected under 35 U.S.C. §103(a) as being unpatentable over Hoang in combination with Gilleo et al. (U.S. 2001/0003058).

Independent claim 48 is asserted to be patentable for the reasons presented above.

If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious. MPEP §2143.03.

Thus claim 52, which depends from claim 48 and incorporates all of the limitations therein, is also asserted to be allowable for the reasons presented above, and Applicants respectfully request that the rejection of claim 52 under 35 U.S.C. §103(a) as being unpatentable over Hoang in combination with Gilleo should be withdrawn.

Additional Elements and Limitations

Applicants consider additional elements and limitations of claims 22-29, 35-40, and 46-52 to further distinguish over the cited references, and Applicants reserve the right to present arguments to this effect at a later date.

AMENDMENT UNDER 37 C.F.R. 1.116 – EXPEDITED PROCEDURE

Serial Number: 10/003,238

Filing Date: October 26, 2001

Title: ELECTRONIC ASSEMBLIES WITH FILLED NO-FLOW UNDERFILL (As Amended)

Assignee: Intel Corporation

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Dkt: 884.535US1 (INTEL)

Conclusion

Applicants respectfully submit that claims 22-29, 35-40, and 46-52 are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicants' attorney, Walter W. Nielsen (located in Phoenix, Arizona) at (602) 298-8920, or the below-signed attorney (located in Minneapolis, Minnesota) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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By their Representatives,

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Date Feb. 7, 2005

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 7th day of February, 2005.

Dennis Kamph

Name

[Signature]
Signature